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Paper and cardboard containing starch and protein fractions of flour having improved strength, stiffness and surface properties, wherein the starch and protein fractions are subjected to a degradation with ammonium persulfate, amylase, an acid, protease or a combination thereof before being introduced to the paper or cardboard. After the starch and protein fractions have been degraded, they can be added to the paper fiber matrix or used as a sizing or glue.